ON THE TREATMENT

OF

CHRONIC EXANTHEMAL KATARRH

OF THE

TYMPANUM.

By JAMES PATTERSON CASSELLS, M.D., M.R.C.S., London,

Fellow of the Faculty of Physicians and Surgeons; Surgeon to the Glasgow Dispensary for Diseases of the Ear.

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In a former communication to this *Journal** attention was directed to that form of katarrh of the ear in which the membrana tympani is unruptured. In the acute stage early incision of that structure was insisted upon, in order, not only to save the patient's life when endangered, but to arrest the progress of the diseased action set up in the middle ear; while in chronic cases the same operation was advocated, in conjunction with other treatment, for the removal of unorganized deposits from that cavity.

In this paper, intended as a completion of the subject treated of in the communication referred to, it is proposed to enumerate the pathological changes that are met with in the more chronic and advanced forms of the same disease, when complicated with destruction of the membrana tympani by ulcerative absorption, and to consider some of the methods of treatment recommended for the cure of the general ear affection, which has preceded, and usually accompanies them.

In proceeding to view the pathological changes that are more commonly met with in this form of katarrh, it is not deemed necessary, or in keeping with the practical aim of this paper, to enter at length into an examination of them: in addition to the partial or complete loss of the membrana tympani already referred to, they are as follows:—

Hyperæmia and hypertrophy, with ulceration of the lining membrane of the tympanum, leading to a diminution of the elasticity of the membranes of the fenestræ, and caries or necrosis of the osseous walls of that cavity; diminution or loss of the vibrations of the ossiculæ, either through ankylosis of their articulations, or by the

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* "On the treatment of Chronic Exanthemal Katarrh of the Tympanum." —Number for August, 1872.

deposition of calcareous and other morbid matters around them, restraining or completely arresting their movements; while the purulent discharge, always present in such cases, frequently occasions, not only their separation* from each other and from their attachment to the walls of the tympanum, but even their expulsion from that cavity†; polypous growths springing either directly or indirectly from the tympanum, and granulations upon its lining membrane; while implication of the mastoid cells, formation of fistulous openings over the mastoid process and elsewhere, with the secondary affections of the nervous and vascular systems, even of the brain itself, though seldom observed, are among the more serious and not unfrequent consequences of this form of ear disease.

Of equal importance, and accompanying the morbid changes just enumerated, adding on the one hand to the danger they are ever ready to excite, on the other to the loathsomeness of the disease, is the secretion of muco-purulent fluid by the tympanic membrane, and its discharge from the meatus, constituting "Otorrhœa." Frequently the precursor and cause, of some at least, of the morbid changes above enumerated, always their co-existant, but at no time a measure of their gravity, this discharge is allowed to run its course for years untreated, nor is relief sought, till the onward progress of the deeper seated malady, manifesting itself by the appearance of new symptoms, awakens alarm, and demands attention to the condition of the organ, and the previously neglected otorrhœa. The popular notion that an ear discharge is conducive to health, appears to be the only explanation of the patience with which this dangerous and disagreeable symptom is borne by otherwise intelligent persons, while the idea, not alone confined to the popular mind, that any measures undertaken for its cure are attended by danger, can only have arisen from the imperfect observation of those cases of chronic katarrh complicated by polypi filling up the external meatus. The mechanical obstruction thus occasioned to the free outflow of the discharge, causes an extension of the diseased action to the deeper seated structures, and not unfrequently the death of the patient. (Politzer.)

In the present increasing knowledge concerning aural science, it is quite unnecessary to combat these notions; yet it may not be out of

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* In the Toynbee collection there are fifteen examples of separation of the ossiculæ from this cause.

† Both in my own practice, and while pupil and assistant to Hinton and Politzer (of Vienna), I have seen numerous cases of deafness from this cause. Prof. Politzer, with characteristic ingenuity, endeavoured, indeed, in one such case to supply the place of the lost ossicular chain, by introducing an artifical membrana tympani, to which a stapes was attached, so placed as to fit into the foramen ovale; the experiment was not successful in attaining the object aimed at, viz.:—restoration of the lost function. Even portions of the labyrinth may be extruded, as shown by the case occurring in my own practice, in which I removed the whole cochlea in a necrosed condition. In a private communication received by me from Professor Schwartze, of Halle, I learn that Guye exhibited at the Congress at Wiesbaden, in September, 1873, a fragment of necrosed bone, removed from the ear in the course of an attack of purulent otitis media. It was judged by the aural surgeons present to be the semi-circular canals.

place here to state, with all the force of axioms, that no ear discharge is salutary, and no danger attends its cure.*

The principles that ought to guide the surgeon in the general treatment of this chronic form of katarrh, as well as the selection of the most appropriate methods, from among the many, recommended for carrying out these principles in any special case, have, in some measure, been suggested by the foregoing observations and enumeration of pathological conditions.

Before proceeding to consider some of the various methods of treatment introduced by British and Continental surgeons, it is necessary, because of its general importance in the treatment of this form of disease, to describe the mode of inflating the tympanum devised and introduced in 1863 by Professor Politzer, of Vienna, which, bearing his name, is known as the "Politzer method" of inflation. The operation consists in passing a stream of compressed air through the nasal passages and Eustachian tubes, at the moment the latter are opened in the act of deglutition by the tensor and levator palati muscles, and is performed as follows:—

The patient takes a small quantity of water into the mouth to facilitate the act of swallowing; the operator, introducing a slightly bent tube into the inferior nasal passage, gives the signal for the patient to swallow, and, in the same instant, closes the opening of the nares, by pressing the alæ over the introduced tube with the forefinger and thumb of one hand, while the inflating bag is forcibly compressed by the other; the air expelled from the bag passing along the open tubes into the middle ear. If the act of deglutition and compression of the bag have been simultaneous, the patient complains of a fulness in the ears, and a peculiar friction sound heard by the operator, usually denotes the successful performance of the operation.†

If the case is uncomplicated, and the katarrhal secretion abundant, in addition to the constitutional treatment which the general condition of the patient may demand, and which it is not necessary to particularise here, the thorough local cleansing of the morbidly active lining membrane of the tympanum, perseveringly carried out, will be followed in a large number of cases by a cessation of the discharge, cicatrization of the lesion in the membrana tympani, and an improvement in the function of the organ, though almost never complete restoration of the normal hearing power. In order to carry out the local treatment indicated above, frequent Politzerising and the application of an astringent to the lining membrane of the tympanum is necessary. The latter can be accomplished in one or other of the following ways:—Inclining the head of the patient, fill the meatus of the affected ear with the astringent solution and Politzerise—or

* The epigrammatic remark by Sir William Wilde, in his work on Aural Surgery, is suggestive, and worthy of remembrance in connection with what is advanced in the text, "so long as otorrhœa is present, we never can tell how, when, or where it may end, or what it may lead to."

† A not uncommon, but hitherto overlooked cause of the failure to inflate the tympana by this excellent method, which some decry, arises from an acinesis of the tube and pharyngeal muscles, especially the tensor and levator palati.

having performed this method of inflation previously, fill the meatus with the fluid as before, and making use of the tragus as a piston, the fluid in either case will pass into the throat, and be felt there. (Politzer.) The mode of Gruber* may be used for a similar purpose. It is an adaptation of the Valsalvian method of inflation, and consists in injecting the fluid into the inferior nasal passage of the affected side, and its pressure by the patient through the Eustachian tube into the tympanum.

This latter method not only possesses no advantage over the two modes recommended by Politzer and described above, but in many cases is injurious.

If the case is complicated by a polypus or warts upon the tympanic lining membrane in conjunction with a narrowing of the external meatus, the difficulty, though great, is not insurmountable; one or more incisions in the constricted part of the meatus, and cautious dilatation afterwards, either by the bi-valve speculum of Kramer, or a tangle or sponge tent, will suffice to overcome the constriction, while the removal of the polypus by Wylde's snare, or the galvano-caustic ecraseur, is easily accomplished.† The complete cure of cases with warty excrescences upon the membrane lining the middle ear is extremely difficult of attainment by the ordinary means, but when these fail, the galvano-caustic cautery, as recommended in such cases by Schwartze, may be had recourse to, and always with success.‡ In these cases, as well before as after the removal of the excrescences, much benefit follows the use of an absorbent powder, such as talc (Hinton), in bringing about a healthier condition of the morbid tissues.

After the lining membrane of the middle ear assumes a healthier condition, and the discharge, as a result of the treatment, is arrested, it is very easily re-excited, especially in cases in which the great loss of substance of the membrana tympani exposes the cavity of the tympanum to external noxious influences. In order to protect the delicate membrane from such a source of irritation and recurrence of the diseased process, and at the same time to improve the hearing power, the use of the artificial membrana tympani is recommended. The simple cotton wool as introduced by Yearsley,§ or the more elaborate instrument of Toynbee¶ may be used; the former, apart from its cheapness, possesses advantages over the latter, not the least of which is the facility with which the patients learn to apply it.

When the case assumes a serious aspect, and the symptoms indicate that the more vital parts are in danger, the principles of surgery are our guide. If the mastoid cells and their bony walls are either the seat of the new inflammatory action or the receptacle of the pent up discharge, a free incision down to the bone, liberating the periosteum, always relieves the intense pain, and generally arrests the further

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* Deutsche Klinik 1865, Nos. 38-39.

† Anwendung der Galvano-Kaustik. Voltolini, S. 267, Wien 1872.

‡ Arch. für Ohrenheilk. B. IV. S. 7.

§ "On a New Method of Treating Deafness," &c. *Lancet*, 1st July, 1848.

¶ "On the use of an Artificial Membrana Tympani." *Journal of the Provincial Medical and Surgical Association*, 1852.

progress of the disease. In order that this latter desirable result should follow, it is important to remember the anatomical peculiarities of the development of the mastoid cells in early and advanced life, for this consideration will determine the position of the incision.* Failing relief from this means, recourse must be had to the operation of trepanation of the mastoid process, in order to give exit to the morbid products confined in the cells of that bone.†

In the selection of astringents for the treatment of this advanced form of katarrh the principle that must guide us is the avoidance of those salts which, either decomposing or being decomposed by the morbid secretion, form insoluble precipitates in the tympanum which, accumulating around the ossiculæ and upon the membranes of the fenestræ, do permanent injury to the function of the organ, or by irritating the tissues, re-excite the inflammatory action.‡

On this account, the salts of zinc (except the sulphate), lead, iron, and silver, are in most cases contra-indicated; so likewise is the aluminic potassic sulphate. The latter astringent, however, demands a fuller consideration.

By far the best of the astringents for general use, irrespective of the size of the lesion in the membrana tympani, or the complications of the special case, is the zinc sulphate in solution. The insufflation of aluminic potassic sulphate in powder is much used by Continental surgeons (Vontröltsch, Guye); but as it coagulates the albuminates of the secretion, and forms deposits difficult of removal, it is for this reason not to be preferred to the zinc sulphate in a simple uncomplicated case with a *large* perforation in the membrana tympani. The use of a solution of the aluminic salt has been abandoned by Continental authorities (Politzer, Vontröltsch, Chimini), on the ground that it causes a furuncular inflammation of the external meatus; but Hinton, who invariably uses this solution in the treatment of such cases, has not yet observed this peculiar effect to follow its use. Whether a solution of chrome alum, which it is said, does not form precipitates so readily with secretions from mucous surfaces, and, when formed, are not so insoluble as those resulting from the use of the sulphate, will give all the good effects of the latter salt, cannot, in the absence of experience, be accurately decided in the meantime.§ Such is, however, much to be desired, for in many cases of katarrhal

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* In early life the incision of the external meatus at its superior and posterior wall, as practised by Vontröltsch, is of the greatest value in such cases.

† This operation, has achieved good results in the hands of Continental and American surgeons. See paper by Jacoby of Breslau in Arch. für Ohrenheilkunde, B. IV. S. 212. No patient can be regarded as skilfully and exhaustively treated who, suffering from this complication of the disease, is allowed to die without an attempt being made to relieve him by this operation. See an elaborate and exhaustive communication on "Die künstliche Eröffnung des Warzenfortsatses" by Professor Schwartze and Dr. Eysell in Arch. für Ohrenkeilk. n.f. B.I.S. 157. June, 1873.

‡ "Ueber die Wahl der Adstringentien bei eitrigen Ohrenkatarrhen." Politzer. Wiener Mediz. Presse. 1866.

§ Its use in several cases, in Professor Politzer's private *clinique*, seemed to result in the formation of precipitates quite as readily as with the aluminic sulphate.

inflammation of the middle ear, a speedier and more permanent result is obtained from the alum preparation than from the zinc salt.

Tannin in watery solution is unreliable, but, dissolved in alcohol, as recommended by Löwenberg, of Paris,* in judiciously selected cases, it is of much service. Even the instillation of pure alcohol, is followed by good results in uncomplicated cases. (Weber.)

The neutralisation method† of Professor Schwartze, of Halle, which consists in passing a caustic solution of argentic nitrate through the tympanum, and neutralising it by a watery solution of sodic chloride, is most effective in uncomplicated cases in which the lesion in the membrana tympani is extensive, and the exposed lining membrane of the middle ear villous and succulent looking. Moreover, its use is in most cases painless, and, notwithstanding the remarks of a recent writer on aural medicine (Allen), free from bad effects.‡

The insufflation of various powders, for the treatment of this as well as other forms of ear disease, has been recently advocated ;§ it is the revival of an old suggestion made by Bonnafont¶ for the treatment of ulcerations of the membrane of the tympanum, and which, at the time it was introduced, received a severe criticism from the pen of a distinguished British aurist. A just appreciation of the merits of this recently re-introduced method in the treatment of katarrhal affections of the tympanum warrants the opinion that the cases of this form of disease are not numerous in which its use is advisable, and that, even in these cases, equally good, indeed better, results can be obtained in a shorter period by the methods of treatment hitherto followed.

Want of space prevents the reports of numerous cases being appended, which, occurring in private and dispensary practice, have been successfully treated by one or other of the above methods.

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* See his paper—"De la Otorreo," El Pabellon Médeco. Madrid, 1870.

† Arch. für Ohrenheilkunde, B. IV., S. 1.

‡ More recently a writer on Electricity (Althaus), venturing, I think, beyond his province, to cast an unwarranted sneer on aural surgeons, proposes to style a recent (?) form of paralysis of the muscles supplied by the portio dura, as "Aural Surgeons' Facial Paralysis," and which, he says (3rd edition, page 562), is caused by "the reprehensible practice of injecting a caustic solution of nitrate of silver (from 40 to 60 grains in the ounce) into the external meatus, for the relief of deafness arising from aural catarrh." I doubt if it is possible to cause paralysis of the facial muscles by injecting such a solution even *into the tympanic cavity* provided the Fallopian canal is normal. Apart from this consideration however, the whole paragraph is unjust as well as ungenerous, and, as it stands, is a libel upon aural surgeons. I venture to affirm that none of the *aural* surgeons of the present day would be guilty of the "reprehensible" and unphilosophic practice ascribed to them by this author.

§ "On the Treatment of Deafness and Diseases of the Ear by the Insufflation of Pulverised Substances."—*Dr. Hunt, in Birmingham Medical Review, July and October*, 1872.

¶ L'Union médicale et le Bulletin thérapeutique, 1851.

FATAL CASE OF CHRONIC MUCO-PURULENT TYMPANITIS (VEL OTITIS MEDIA PURULENTA), INFLAMMATION OF MASTOID CELLS OF BOTH TEMPORAL BONES, INVOLVING THEIR OSSEOUS STRUCTURE.

ON the 12th February, 1873, Dr. Edward M'Millan, of this city, requested me to meet him in consultation on the case which is here briefly reported.

J. W., aet. 12, at school till a few days ago; intelligent and active; delicate and pale, yet well developed, and has had upon the whole good health till now.

History.—About eight years ago caught a severe cold, followed by pain in head and ears. After some days there was a discharge of pus from the meatuses and relief. This discharge continued, more or less, for a considerable length of time, but has ceased for several months past. At first he had occasional slight pain in ears at long intervals, but does not now suffer from, nor has he lately complained of, this symptom.

His *hereditary history* is not perfectly satisfactory; for, although no other member of the family has at any time suffered from symptoms similar to his, yet his father has a perforation of the membrana tympani of the right side, and other evidences of purulent inflammation of the tympanum, suggesting the possibility of a transmitted taint, or, at least, a pre-disposition to this form of ear disease.

Since coming under Dr. M'Millan's care, J. W. has had frequent and apparently causeless vomiting, much nocturnal pain in head preventing sleep, double convergent strabismus; during the night, heat of skin and accelerated pulse, both of which, as well as the headache, are absent during the day. The tongue is natural, bowels constipated, and appetite capricious. Further, although his aspect is slightly vacant, he answers questions within his comprehension intelligently and coherently, and there is no delirium at night.

Patient's *present condition* is as follows:—In addition to the symptoms above mentioned, we find the external ear region normal in form, temperature, and sensation. *Steady* and *firm* pressure on any part of this space, including tragus, does not occasion pain. If, however, the mastoid region is *sharply and suddenly*, but not *violently*, concussed, a sensation of deep-seated lancinating pain is occasioned. This persists for some time (5 or 10 minutes), and is similar to that from which he suffers at night. Both meatuses are filled with plugs of cerumen and epithelial debris, on removal of which we find in both ears evidence of long existing disease. The *right membrana tympani* has suffered an extensive destruction of its tissue in both posterior quadrants, and the edges of the perforation are cicatrised. The remaining portion of the membrane is thickened and opaque—

the malleus being faintly visible through the sodden tissues. The lining membrane of tho cavity of the tympanum, thus exposed, is red, deeply congested and moist. The *left membrana tympani* is more extensively destroyed, a narrow strip of its tissue at the periphery alone remaining. The handle of the malleus, denuded of its covering, and deprived of its support, projects into the tympanic cavity, whether it is drawn by the tensor tympani muscle; the lining membrano of this cavity is yellowish grey in colour, and moistened by purulent secretion. The meatuses are congested at their inner third and highly sensitive.

The *naso-pharynx* is congested, relaxed, and slightly granular. *Eustachian tubes* both open, but affected by ehronic mucous katarrh derived from the naso-pharyngeal cavity. Further examination of the case showed that the *auditory nerve* was in a normal state. The *hearing distance* was for each ear—mono-syllables spoken in a moderate tone—6′; for the watch—(capable of being heard by a healthy ear at 15′)—this case gave on $\frac{R\ 6''}{L\ 2''}$ as its limit. There were no signs of pent-up discharge, and no polypi in either ear.

Diagnosis.—After removal of the accumulations from the meatuses, and it became possible to investigate the condition of the ears, the real nature of the case was reeognised without difficulty. The morbid changes there observed, together with the unmistakeable symptoms of cerebral mischief, left us in no doubt that we had to deal with a meningoal affection arising out of the ear disease; the latter having probably caused caries of the osseous tissue of the tympanic walls or mastoid cells—a case of muco-tympanitis with probable caries, and secondary meningitis.

The *prognosis* was decidedly unfavourable, yet not without a hope that the treatment, which had for its object the arrestment of the morbid process, might for a time at least avert the issue which the grave character of the symptoms caused us to fear.

The *treatment* was as follows:—Local depletion over mastoid processes; free, but not exeessive purgation; the administration of alterative mercurials and full doses of an opiate at bed-time, or oftener if necessary, in order to proeure relief from the nocturnal pain, and if possible sleep. Frequent Politzerising was recommended, and the use of the nasal douche. Careful dieting and mental and physical rest were enjoined.

For three days after this treatment was begun there appeared to be a considerable improvement in our patient's condition; there was much less irritability of stomach, and the headache, though not quite gone, was less intense, but never absent; the hearing power also had considerably increased.

This improvement, however, was of brief duration. The pain in the head recurred with its former violence, lasting each day about ten hours, from 8 p.m. till 6 a.m., from which time till evening of the same day he had freedom from this distressing symptom.

From this time till his death (ten weeks afterwards), he was partly confined to his bed, and at times able to move about his room. He had now in succession double vision, blindness, strabismus,

deafness; Bell's paralysis; loss of memory, of taste, and of speech; severe pains in the lower extremities, and inability to walk, apparently from paralysis of those limbs; lastly, a semi-comatose condition, in which he lay for several days conscious to painful impressions, but out of which state he was roused with great difficulty. From this helpless and well-nigh hopeless condition he awakened, steadily regained his lost powers and faculties, became cheerful, and took a slight degree of interest in many little things that attracted his attention, improving at the same time in his general appearance.

The treatment which had been for some time suspended, except the occasional opiate, was now resumed with such modifications as the changed circumstances of the case demanded; the kidneys were stimulated to increased action, and full doses of the iodide of potassium administered.

The almost total absence of the nocturnal pain, and the lessened irritability of stomach, together with the improvement in his general condition, which indicated a gradual absorption of the effusion, renewed our hopes for a time.

This improvement in the patient's condition only lasted six days, after which interval he began to relapse, all the old symptoms steadily returning—the nerves of special sense becoming affected as before, violent nocturnal headache, and furious delirium adding to his distress. On the 14th April, when last seen by me, he was unable to stand or walk, apparently from general paralysis of voluntary muscles, and was roused with difficulty from a semi-dormant state, from which he seldom voluntarily wakened. The sensation of the surface of the body at this time seemed to be normal. Between this date and his death his parents reported that he had ejected a large quantity of fluid by the mouth of a purulent character, a similar kind of fluid coming from his right ear about the same time.* On the date last mentioned, I satisfied myself that there was no material change in the condition of the ears from that first observed and recorded above.

After this, Dr. M'Millan, who continued to watch the case, reported that the patient gradually sank, became more helpless, and died, after a severe attack of convulsions, at 7 a.m., on the 28th April, 1873.

Sectio cadav. 34 hours after—present and assisting, Drs. M'Millan and Rodman.

On removing the calvarium all the meningeal vessels are seen distended with dark coloured blood — the membranes themselves covering the convexity of the brain appear normal. On removing the brain, which presents nothing worthy of remark, about six ounces of a clear serous fluid is found effused at the base of the skull, at which place the membranes are highly congested. The dura matter covering that part of each petrous-bone corresponding to the roof of the mastoid cells and tympanum is thickened, presents inflammatory patches, and is easily detached from the bone; examined on its interior aspect it is rough at the parts corresponding to the eroded and

* There is no reliable evidence as to its purulent character.

discoloured bone. Removal of the roof of mastoid cells and tympanum on the left side, discloses the former partly filled with curdy yellowish pus, and the septa softened and easily broken down; while the walls, especially that part of them forming the roof, are inflamed and softened, one part being carious, this latter corresponding with the diseased portion of the dura matter. The tympanum is almost filled up by hypertrophy of its lining membrane, and the entrance to the mastoid cells nearly obliterated from the same cause. The head of the malleus is eroded, and numerous membranous bands bind the ossicles to each other, and to the tympanic walls. The condition of the left membrana tympani corresponds with the description given of its condition as observed during life. It was not considered necessary to examine the tissue of the brain, or the condition of the other organs or structures, because, in verifying the diagnosis, a sufficient explanation had been found for the varying character of the symptoms, and the chronic course of this, in some respects, remarkable case.

Remarks.—This case is an example of the advanced form of disease of the tympanic cavity, concerning which we have written in previous numbers of this *Journal*. It is possessed of considerable interest, on account of the remarkable and varying character of the symptoms which at one period awakened a hope of the patient's recovery, notwithstanding the very unfavourable prognosis formed at its outset. Its interest is still further enhanced to the general practitioner of medicine, because, in our experience, it is typical of a class of cases which are of far more frequent occurrence than is commonly supposed. That the fatal termination was primarily due to the chronic ear disease does not admit of doubt; and it is equally unquestionable that had this disease, at its first appearance in early childhood, received the treatment which was recommended for such cases in a previous communication, the serious pathological changes which the *post-mortem* examination revealed would have been prevented, and the life of the patient saved.